## **Communication Systems**

Papers Presented at the AIAA SciTech Forum and Exposition 2024

Orlando, Florida, USA 8 – 12 January 2024

ISBN: 979-8-3313-0418-8

## Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



| a    |           | •       |         |      | 41    |        | •         |           |         |         | 41 .    | • 4   | •          |
|------|-----------|---------|---------|------|-------|--------|-----------|-----------|---------|---------|---------|-------|------------|
| Some | tormat    | ICCITAC | inheren | t in | the e | -media | Version   | may 9     | alen ar | mear II | 1 thic  | nrint | version.   |
| Some | ivi illat | issucs  |         |      | u     | -mcuia | VCI SIUII | 11161 7 6 | aisu ap | pcai ii | 1 (1113 | թւաւ  | VCI SIUII. |

The contents of this work are copyrighted and additional reproduction in whole or in part are expressly prohibited without the prior written permission of the Publisher or copyright holder. The resale of the entire proceeding as received from CURRAN is permitted.

For reprint permission, please contact AIAA's Business Manager, Technical Papers. Contact by phone at 703-264-7500; fax at 703-264-7551 or by mail at 34922 Uwptkug'Xcmg{'Ftkxg."Uwkg'422, Reston, VA 20191, USA.

## TABLE OF CONTENTS

## **COMMUNICATION SYSTEMS**

| On the Energy Efficiency and Spectral Efficiency Trade-Off of Multi-User Full-Duplex Cognitive Radio Networks Under Imperfect Spectrum Sensing | 1  |
|--|----|
| Mohammad Ranjbar, Nghi Tran, Tutku Karacolak, Khanh D. Pham  | 1  |
| Simplified DES with Noisy Ciphertext: A Cross-Layer Security Approach  | 10 |
| 4K High Definition Video and Audio Streaming Across High-Rate Delay Tolerant Space Networks  | 15 |
| Patterns of Radio Frequency Propagation  | 37 |
| Unmanned Aerial Vehicles Detection Using Acoustics and Quantum Signal Processing   | 55 |
| Exploring New Frontiers in Space Communications: Enhancing Delay Tolerant Networking Through Cloud and Containerization                        | 73 |
| Blake LaFuente, Rachel Dudukovich, Nadia Kortas, Ethan Schweinsberg, Brian Tomko,<br>Alexander Kotliarchuk                                     |    |

**Author Index**